Prevalence and fertility of hydatid cyst in slaughtered Farm animals of Tabriz city, Iran

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Abstract: Species under genus Echinococcus are small tapeworms of carnivores with larval (metacestode) stages known as hydatid proliferating asexually in various mammals including humans. Hydatidosis is one of the most important health problems in Iran. Scrutinizing disease situation in local intermediate and final hosts to find appropriate controlling and preventing methods is of special importance. This study was performed to determine the prevalence and types of hydatid cysts in entrails of slaughtered food animals in Tabriz city. In this descriptive-cross sectional study, arranged with Veterinary Office and Slaughterhouse of Tabriz, all 4981 food animals slaughtered along the study were investigated of having hydatid cyst after butchering and separation of internal organs. The isolated innards of the slaughtered animals were examined of having hydatid cyst by trained experts administrated by researchers. If a cyst be traced by experts, all information about slaughtered food animals and contaminated organ was recorded on especial sheets and then sent to Research Laboratory of Parasitology Department, veterinary Medicine Faculty, to determine its fertility status. Of 4981 food animals studied 259 (5.2%) were infected by *Echinococcus granolosus*, among them, 2.8% were sheep, 8.1% were cattle, and 11.1% were water buffalos. The highest frequency of cysts was pulmonary type of hydatid cyst. About 27% of cysts were fertile and the other 73% were infertile. The fertility rates of hydatid cyst in sheep, was 37.5% for liver and 28.5% for lung; in water buffalo, it was 44% for liver and 46% for lung; and in cattle, it was 44% for liver and 40% for lung infection. The results of this study showed that the rampancy of contamination by hydatid cyst as well as its fertility rate was obviously high in slaughtered water buffalos. So, because of economic forfeitures of obliteration of these contaminated entrails and to prevent the transmission of the infection to human, it is extremely necessary to control propagation of the disease in this region.

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1. Introduction

Hydatidosis has dispersed worldly and is one of the common dangerous diseases between human and animals and is found abundantly in areas that human, dogs and herbivorous are in close relationship (Garedaghi et al., 2011). Hydatid cyst that in fact is the larval stage of tape worm *Echinococcus granulosus* is one of the zoonotic disorders that could infect human (Soulsby, 1982). Infection to hydatid cyst has worldwide propagation and is domestic in some parts of the world like Australia, Greece, as well as Middle East countries including Iran (Fakhkhar et al., 1990). Because of extensive distribution throughout theworld, it gets such a significant attention that prevention of hydatidosis is one of the dynamic programs of World Health Organization in the field of zoonotic disorders (WHO Report, 1982). Distribution of this disease is more extensive in the rural regions that use dogs as guard of domestic animals (Radfar et al., 1991) By contamination of livestock, hydatid cyst causes tremendous economic detriment on the world countries. On the other hand, infection of a person to this illness causes serious risks for his health and in some cases could bring about the risk of death (Dalimi et al., 2002). For example, in the studies done in Iran throughout the years 1977 and 1978, the economic loss for obliteration of contaminated viscera from animals of slaughterhouse as well as the cost of surgery, hospitalization before and after surgery, convalescence period, and mortalities caused by this disease was about 180,000 dollars annually (Radfar et al., 1991); although it could be cited that because of yearly increase in prices, the mentioned costs must be much more. Some researchers believe that the hygienic importance of the infection is much more than its economic one and they do immense efforts to control it (Gemmel et al., 1985). Undoubtedly it is necessary for us to know more about its epidemiology and dispersion. Epidemiologic researches done in each geographic location could be used to extinguish and even root its endemic disorders. So a comprehensive study about this disorder seems to be essential to proffer adequate guidelines to struggle with and control the disease. So this study was done to deduce the prevalence of infection by hydatid cysts in slaughtered food animals of Tabriz city.

2. Materials and Methods

In this descriptive-cross sectional study, after necessary coordination with veterinary office, all food

animals that were slaughtered throughout the study in industrial slaughterhouse of Tabriz city were investigated. The count of all animals that were inspected was 4981, including 3065 sheep, 1288 cattle, and 628 water buffalos. The procedure of the study was in this manner that first of all, separated entrails of all slaughtered animals were examined precisely by educated experts for the presence of hydatid cyst, and when a cyst had been seen, all information about the slaughtered livestock and contaminated organ was recorded on specially designed sheets. After it, the contaminated organs of infected animals were sent to Research Laboratory of Parasitology, veterinary Medicine Faculty, to confirm the presence of cyst and to determine its fertility status.

3. Results

In this study 4981 food animals were examined, among them 259 were infected by hydatid cyst, that is, the contamination proportion of this infection was 5.2%. This proportion was the highest in water buffalos (11.1%). Table 1 shows the contamination abundance and proportion separately in each examined food animals. Table 2 accents that in the examined animals, abundance of pulmonary type of hydatid cyst was the highest. In the view of the fertility of cysts, as cited in Table 3, fertility rate was 27% (42% of fertile cysts was hepatic and the other 58% was pulmonary) and the other 73% of cysts were infertile (27% infertile cysts was hepatic and the other 73% was pulmonary).

Table 1: Contamination abundance of hydatid cyst in examined carrions in Industrial Slaughterhouse of Tabriz City

Food animals	Examined No.	Contaminated No.	Contaminated (%)
Sheep	3065	85	2.8
Water buffalo	628	70	11.1
Cattle	1288	104	8.1
Total	4981	259	5.2

Table 2: Contamination abundance of hydatid cyst according to contaminated organ in examined carrions in Industrial Slaughterhouse of Tabriz City

Food animals	Liver No.	%	Lung No.	%
Sheep	32	1	49	1.6
Water buffalo	28	4.5	44	7
Cattle	41	3.2	65	5
Total	101	8.7	158	13.6

Table 3: Contamination abundance of hydatid cyst according to fertility and infertility status of the cysts in examined carrions in Industrial Slaughterhouse of Tabriz City

Food animals	Liver				Lung			
	Fertile No.	%	Infertile No.	%	Fertile No.	%	Infertile No.	%
Sheep	12	37	20	63	14	28.5	35	71.5
Water buffalo	13	46	15	54	20	47	24	54.5
Cattle	18	44	23	56	26	40	39	60
Total	43	42	58	27	60	58	98	73

4. Discussion

Hydatid disease is known since the time of Hippocrates. Although the liver is the most common site of infection in adults, the most common site of infection in children is the lung (Garedaghi et al., 2011). Hydatid cyst is a cyclo-zoonotic parasite and could involve human being seriously. It could also infect domestic quadrupeds like cow, sheep, goat, water buffalo, camel, elk, llama, pig and horse (Soulsby, 1982). The disorder caused by this parasite (hydatidosis) is one of the most important health service as well as economic problems in various parts of the world including Iran; it is endemic especially in societies that veterinary is a common job. Studies done recently on various hosts of this parasite in several locations in Iran revealed that contamination by it is dramatically high; as contamination of sheep and goat to this infection was reported respectively as follows: 2.4 and 6% in Arak (Mohebali et al., 1995), 5.5 and 5.7% in Kerman (Sharifi et al., 1996), 3.9 and 2.5% in Oghlid (Oghlidi, 1987), and 4.9% in Feridoun (Nilforoushan, 1987). The probable reasons for the statistical differences between infection rates in various cities could be brought as: hygienic status of slaughterhouses, climatologic conditions, contamination rate in the intermediate host, dog in

each place, slaughtering manner and feeding status of animals. Some findings and experiments shows that an appropriate and short-time guideline to control this disease in human communications, could be treating stray dogs and cattle, and education of hygienic principles as another short-time guideline may not be much effective and the studies fulfilled in some regions with high endemicity of this disease affirms this claim (Macpherson et al., 1986). Lifecycle of the parasite in each location depends to various factors. The main factor is the facility to reach discarded entrails of livestock by dogs. The more entrails are contaminated by cyst, the more dogs may be infected by consuming them and vice versa. But this factor is notthe sole reason of parasite dispersion, and some studies quoted that there is not always a parallel relationship between the infection of dogs and sheep. Other factors that severely participate in contamination proportion of dogs includes: the kind of animal infected by cyst (sheep, cow, goat, camel, pig, etc.), infected organ (liver, lung, etc.), cyst's size, its fertility, etc. (Fallah et al., 1998).

In this study, the rampancy of hydatid cyst in sheep, water buffalos, and cows were 2.8, 11.1 and 8.1%, respectively. As shown in Table 1, the prevalence of contamination in sheep is less than it is in both water buffalos and cows and in contrast to some other studies, the infection rate is not very high. Example of such studies, includes a study done in Zanjan, the contamination rampancy's were 19% in sheep, and 23% in cows (Nourian et al., 1998). In another study done in Shirvan, 27% of cows exhibited hepatic and 32% showed pulmonary infections, whilst contamination of sheep liver was 6.9% (Javaheri et al., 1996). Checking some studies accomplished in other countries showed severe contamination rampancy's of this parasite in its hosts, as contamination rate in Pakistan was 38.9% for cows and 33% for water buffalos (Khan et al., 1990), whereas its rate in North India was reported as 48% for water buffalo, 48% for sheep, and 21% for goat (Singh et al., 1988). Table 2 Shows that the most contaminated organ in sheep, cattle and water buffalos, is lung, and this finding is in parallel with previous studies (Oghlidi, 1987; Sharifi et al., 1996; Mohebali et al, 1995). As cited above, the fertility of cyst is one of the mainfactors that could influence contamination proportion in dogs. In this study, the fertility rates of hydatid cyst in examined animals were as follows: in sheep, it was 37% for liver and 28.5% for lung; in water buffalo, it was 46% for liver and 47% for lung; and in cattle, it was 44% for liver and 40% for lung infection. A study done in Iran exclaimed fertility proportion of hydatid cyst as 88, 19 and 70% for sheep, cow and camel, respectively (Hosseini et al., 1998). In another study done in Zanjan to determine fertility rate of cysts, it was clarified that 49% of cysts in sheep were fertile and another 30% were a mixture of fertile and infertile cysts, whereas only 3.5% of cysts in cows were a mixture of fertile and infertile cysts (Hamidieh et al., 1998). Another study done in Arbil, North Iraq, reported that the fertility rates of the cysts were 64, 37and 29% in sheep, goats and cows respectively (Saeed et al., 2000). As it could be deduced from Table 3, fertility rate of hepatic cysts is more than its pulmonary type; and comparison of the tested animals about the importance of this rates shows that it is also more important in water buffalos than the other two ruminants. Although the contamination rates of livestock (especially sheep) were not seriously high in this study, high fertility rate of cysts could eventually cause considerable contamination of dogs to mature worms and subsequent distribution of many zygotes in nature. In this study, both propagation and fertility rate of hydatid cyst in water buffalos were higher than cattle, as well as sheep. Because of increasing local tendency forranching water buffalos, that with current hydatidosis status of the place could cause no compensable detriments on local economic and hygienic orderliness, it is recommended that the basis of some fundamental activities be inserted in procedural programs of veterinary office. Some of these activities could be as follows: establishment of hygienic slaughterhouses, obliteration of stray dogs, treatment of domestic and cattle-guard dogs, education of ranchers and the people who contact livestock, designing social educational programs about correct sepulchering procedures, especially for the people living in places that the disease is endemic there, education of people about transmitting ways, and appraising weak and strong points of hygienic and veterinary services.

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References:

1. Dalimi A, Motamedi GH, Hosseini M, Mohammadian B, Malaki H, Ghamari Z, Ghaffarifar F. Echinococcosis/hydatidosis in western Iran. Vet Parasitol 2002;105:161-171.
2. Fakhkhar M, Masoud J. Evaluation of rampancy of hydatid cyst in Industrial Slaughterhouse of Ghom Province in 1990, 3rd National Congress of Parasitic Diseases in Iran 1990;1990-1991.
3. Fallah M, Shahbazi G, Ghasemi M. Prevalence, Fertility and Other Specifications of Hydatid Cyst in Slaughtered Livestock of Hamadan City in 1998. Sci J Hamadan Univ Med Sci 1998;9:50-55.

4. Garedaghi Y, Khayatnouri M, Safarmashaei S. Effect of Triclabendazole and Levamisole on Experimental Hydatic Cyst in Rat. American Journal of Animal and Veterinary Sciences 2011;6(2):77-79.
5. Gemmel MA, Lawson JR. Epidemiology and control of hydatid disease. In: Thompson R.C.A. (Ed). The biology of echinococcus and hydatid disease. London 1985;209-210.
6. Hamidieh H, Deylami-Asl A. Specifications and Fertility Rate of Hydatid Cyst in Slaughtered Animal in Zanjan's Slaughterhouse in 1998. Sci J Hamadan Univ Med Sci 1998;7:10-14.
7. Hazrati Tappe KH, Mousavi SJ, Barazesh A. Prevalence and fertility of hydatid cyst in slaughtered livestock of Urmia city, Northwest Iran. J parasitol vec bio 2011;3:29-32.
8. Hosseini SH, Eslami A. Morphological and developmental characteristics of echinococcus granulosus derived from sheep, cattle and camels in Iran. J Helminthol 1998;72:337-341.
9. Javaheri M, Ghasemi M. Abundance of Hydatid Cyst in Slaughtered Cow and Sheep of the Slaughterhouse of Shirvan City among 1983-85. Abstract Article in 3rd National Congress of Zoonotic Diseases in Iran 1996;223.
10. Khan MQ, Afzal M, Ali S. Prevalence and serology of hydatidosis in large ruminants of Pakistan. Vet Parasitol 1990;37:163-168.
11. Macpherson CN, Wachira TM, Zeyhle E, Romig T, Macpherson C. Hydatid disease: Research and control in Turkana, IV. The pilot control programme. Trans Roy Soc Trop Med Hyg 1986;80:196-200.
12. Mohebali M, Sammak AR. A Survey on the Hyadatidosis in Human and Hydatid Cyst in Rearing Livestocks Witch Were Slaughtered in Arak Slaughter House. Sci J Kerman Uni Med Sci 1995;3:2-27.
13. Nilforoushan R. Determination of Rampancy of Hyadatid Cyst in Slaughtered Cattles of Feridoun City, 2nd National Congress of Parasitic Diseases in Iran 1987.
14. Nourian A, Ataian A, Haniloo A. A Survey on Specifications of Hydatid Cyst in Zanjan Province. 10th Congress of Geographic Medicine and 6th Congress of Infectious and Tropical Diseases in Iran 1998;pp:159.
15. Oghlidi ME. A Survey on Prevalence of Hyadatid Cyst in Livestock of Oghlid Slaughter House among 1983-1986. 2nd National Congress of Parasitic Diseases in Iran 1987.
16. Radfar MH, Moradi K. Study of Prevalence Rate of Hydatid Cyst in Slaughtered Sheep and Goat in Kerman's Slaughterhouse. 3rd National Congress of Parasitic Diseases in Iran 1991.
17. Saeed I, Kapel C, Saida LA, Willingham L, Nansen P. Epidemiology of Echinococcus granulosus in Arbil province, Northern Iraq, 1990-1998. J Helminthol 2000;74:83-88.
18. Sharifi I, Daneshvar H, Ziaali N. Evaluation of a Control Program on Hydatid Cyst in the city of Kerman. Sci J Kerman Univ Med Sci 1996;3:168-74.
19. Singh BP, Dhar DN. Echinococcus granulosus in animals in Northern India. Vet Parasitol 1988;28(3):261-266.
20. Soulsby EJL. Helminths/Arthropods and Protozoa of domensticated animals. London, Bailliere Tindall 1982;118-786.
21. World Health Organization report of WHO. Informal consulation on research requirements for echinococcusis/hydatidosis. Montreal, Canada, 3rd, WHO CDs VPH 1982;pp:37.

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